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Environmentally Sustainable Defence Activities



A Sustainable Development Strategy
for National Defence

December 1997



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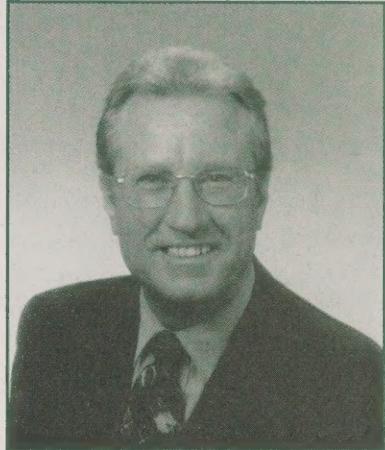
http://www.dnd.ca/admie/dge/sds/sds1_e.htm

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From the Minister of National Defence

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

Our Common Future



Sustainable development is the business of all Canadians. It represents many of our most cherished values and goals. We all want a healthy environment, a sound economy, and a strong society. Taking action in ways that respect the links between all three of these elements is the practical application of sustainable development.

The Department of National Defence and the Canadian Forces (DND/CF) are contributing their part to the Government of Canada's overall effort to bring about sustainable development. We recognize that what we do and how we do it affect the lives and environment of Canadians. That recognition has encouraged us to improve our environmental performance and our appreciation of our social and economic impacts. This report formalizes our plans and commitment to excellence.

Our contributions to sustainable development are anchored in our larger mandate to defend Canada and Canadian interests and values while contributing to international peace and security. A world with a weakened environment, fractured societies, and economic uncertainty for billions of people is an unstable world. It is a world in which Canada's interests and values are at risk. The men and women of DND/CF may be called on to deal with the impacts of that instability. It is in our interest to prevent that from happening. It is in our interest to encourage sustainable development.

This report indicates our assessment of the sustainable development issues that face DND/CF. It is the result of external consultations undertaken with selected people and groups that are interested in sustainable development and defence issues. It has been shaped by substantial internal consultations that will ensure the greatest possible commitment to our goals, objectives, targets, and action plans. The results will bring benefits for Canadians while contributing to sustainable development on an international scale.

A handwritten signature in black ink, appearing to read "Arthur C. Eggleton".

Arthur C. Eggleton
Minister of National Defence

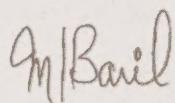
National Defence and the Canadian Forces

Turning Talk into Action

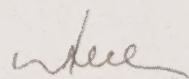
We believe that we can help shape a better future for Canada through the application of the principles of sustainable development to the defence of Canada.

Our aim is to demonstrate responsiveness to, and responsibility for, protecting the environment while ensuring environmental stewardship and protection of the national and corporate assets entrusted to DND/CF.

Achieving this aim is the business of every member of the Department of National Defence and the Canadian Forces.



Chief of Defence Staff

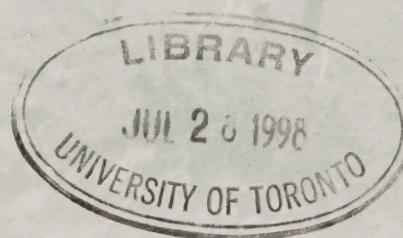


Deputy Minister



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Introduction

Environmentally Sustainable Defence Activities:

Activities conducted by DND/CF, including military operations and training, as well as departmental logistics and administrative support, that meet the needs of the present without compromising those of the future.

The culmination of various international studies and conferences on the state of our environment in the twentieth century came about in 1987 with the release of Our Common Future, the Report of the World Commission on Environment and Development (commonly known as the Brundtland Commission). This commission of distinguished scientists provided a

vision of what is needed to ensure the continuation of civilization in the next century. That vision, termed **sustainable development**, means finding ways to create "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

The Brundtland Commission's definition of sustainable development has been adopted around the world. In Canada, each federal government department is now required by law (the amended Auditor General Act) to prepare a Sustainable Development Strategy (SDS) that outlines how the department will contribute to sustainable development. The strategy must be tabled in Parliament by December 1997, and updated every three years thereafter. Progress toward the objectives set out in each SDS will be audited by the Commissioner of the Environment and Sustainable Development in the office of the Auditor General.

The Department of National Defence and the Canadian Forces (DND/CF) recognize that they have the potential to affect the Canadian environment, and the responsibility to help protect that environment. Many programs have been introduced to limit the impacts of defence activities and to contribute to the health and well-being of Canadians. These programs have ranged from placing oil-catching drip pans under parked vehicles to emergency aid for flood victims. In this first SDS, DND/CF's tradition of awareness and contribution to environmental protection is amplified. Existing initiatives are incorporated where appropriate, and new objectives are outlined to increase National Defence's contribution to sustainable development.

DND/CF recognizes that sustainable development must be integrated into the business planning process. In the coming years, the SDS and the Business Plan will become one. For the moment they are complementary.

Natural forest ecosystem at CFB Kingston



Departmental Profile

The mission of DND/CF is to defend Canada and Canadian interests and values while contributing to international peace and security. Canada's defence policy calls for maintenance of multipurpose, combat-capable forces specifically charged with:

- ◆ defending Canada;
- ◆ defending North America in cooperation with the United States; and
- ◆ contributing to international peace and security.

Clearing land mines during NATO operations



Key activity areas for these forces include:

- ◆ demonstrating the capability to monitor and control activity in the approaches to Canada;
- ◆ participating in a full range of multinational operations around the world;

- ◆ assisting civil authorities responding to natural and man-made disasters (e.g., floods, storms, and forest fires) and safeguarding human lives (e.g., search and rescue);
- ◆ cooperating with other government departments to fulfill national objectives (e.g., fisheries patrols); and
- ◆ maintaining the ability to operate effectively at sea, on land, and in the air with US military forces to defend the northern half of the Western Hemisphere.

DND/CF is the largest federal organization, with some 60,000 regular Canadian Forces troops, 30,000 reservists, and about 20,000 civilian employees. Within the department, Emergency Preparedness Canada protects lives and works to reduce damage to property under the mandate of the *Emergency Preparedness Act*. The Disaster Assistance Response Team (DART) conducts international humanitarian assistance operations and, in exceptional circumstances, would respond to domestic humanitarian emergencies.

Planned expenditures by DND/CF for fiscal year 1997/98 are slightly less than \$10 billion, which is about 30% of the total operational and capital spending of all federal departments.

DND/CF manages more than 10,000 individual facilities at hundreds of locations, maintains a fleet of more than 30,000 vehicles, and administers over 20,000 km² of land. An added consideration in our planning is that more than three-quarters of DND/CF's locations are near communities made up largely of Aboriginal people.

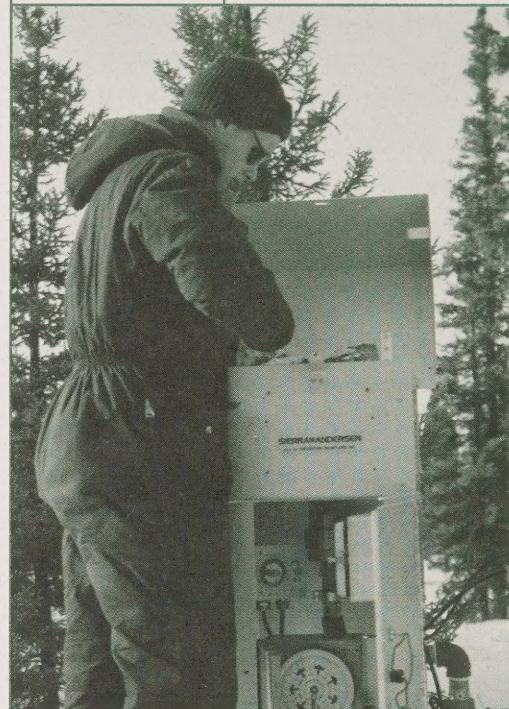
DND/CF operations have significant environmental, social, and economic impacts, not only on communities near operational sites but throughout the country where reservists maintain a Canadian Forces presence. At the same time, we are committed to grooming future leaders through our extensive cadet training program.

The operational climate within DND/CF will be affected by the need to respond to a number of federal decisions. The department is a major focus of the Government of Canada's attempts to reduce government spending, through such means as already-announced base closures, reorganizations, and staff reductions. These actions have had economic and social impacts on many communities. Additional environmental considerations may arise as facilities are decommissioned.

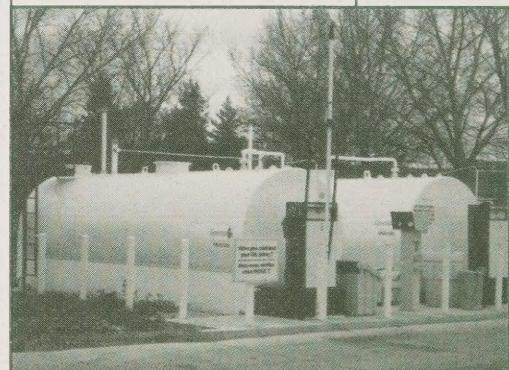
DND/CF is responding to a changing Canadian social climate. It responds, for example, to the amended *Employment Equity Act* by ensuring an appropriate representation of Aboriginal people, disabled people, visible minorities, and women in the work force of its Capability Components — the various organizations that support the work of the Maritime, Land, and Air Forces.

This SDS builds on DND/CF's record of commitment to environmental management. Environmental management at National Defence was most recently controlled through NDHQ Policy Directive P5/92 [Canadian Forces and National Defence Policy on the Environment](#) (which is currently under review).

Air monitoring station
at 5 Wing Goose Bay



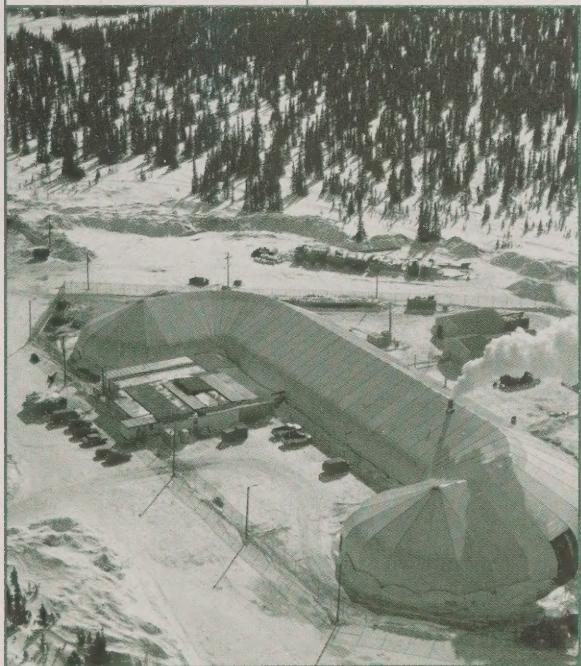
Modern double-walled above-ground
fuel storage tanks at 17 Wing Winnipeg



Double-walled used-oil storage tanks at a prototype Green Base



Temporary mobile PCB incinerator at 5 Wing Goose Bay



Environmental management within DND/CF has identified and improved the environmental impacts of various DND/CF operations. For example:

- ◆ National Defence has undertaken a series of Environmental Baseline Studies at its major bases. These studies, in conjunction with special studies of sites that were being closed, identified situations where environmental impacts and potential impacts required remedial work.
- ◆ DND/CF continues its concerted effort, begun in the late 1980s, to phase out equipment containing polychlorinated biphenyls (PCBs), segregate PCB-contaminated materials, and destroy such materials. PCBs are being eliminated from facilities and equipment wherever cost-effective and operationally feasible.
- ◆ Efforts to manage fuels and other hazardous materials more carefully are ongoing. A phase-out of ozone-depleting substances (ODSs) from DND/CF operations is under way. As well, personnel are identifying and disposing properly of all hazardous wastes.
- ◆ DND/CF has taken steps to reduce energy and resource use. This began with review and improvement in vehicle fleet management procedures, power generation practices, and training methods. Waste reduction efforts are under way for oils and lubricants, as well as paper and other materials.

Issue Scan

DND/CF undertook a series of steps to identify sustainable development issues that are currently significant for National Defence. We began by identifying the values that Canadians want to sustain, namely:

- ◆ human health;
- ◆ access to the basic necessities of life (food, clothing, shelter);
- ◆ ecological functions of the Earth (e.g., nutrient cycling, water purification); and
- ◆ companionship, peace, culture, heritage, knowledge, and tolerance.

We considered the stresses that interact with these values, creating challenges to sustainable development. We grouped these stresses into six types:

- ◆ pollution;
- ◆ patterns of resource use;
- ◆ changes in ecosystem integrity;
- ◆ environmental emergencies;
- ◆ influences on health and well-being; and
- ◆ national security.

These values and stresses have varying effects on sustainable development. Their importance for DND/CF depends on both whether we are part of the problem or

part of the solution. For example: DND/CF is part of the climate change challenge (our vehicles emit greenhouse gases); DND/CF takes part in enforcement of pollution laws (searching for maritime polluters). In yet other instances, DND/CF may have to deal with the consequences of environmental damage (e.g., increasing numbers of environmental refugees).

The federal interpretation of sustainable development addresses three elements: a healthy biophysical environment, a functional society, and a robust economy. In this first SDS, DND/CF has chosen to focus on the environment. This approach reflects the importance of a healthy environment to our society and economy, as noted by the Commissioner of the Environment and Sustainable Development.

Internal and external consultations, reviews of past and current DND/CF planning documents, and analysis of global and national discussions on the state of the environment have led us to identify the following as issues related to conserving our environment:

- ◆ ecosystems;
- ◆ pollution prevention;
- ◆ hazardous materials;
- ◆ climate change; and
- ◆ cultural resources.

Opportunities for Sustainability: Project Swiftsure

Canada's remaining limited stockpiles of chemical weapons, left over from World Wars I and II, were recognized as a continuing environmental risk. In 1990, these stockpiles were safely destroyed, with no detectable environmental impacts.

A threat to the health of the environment and communities of southern Alberta was thereby eliminated.

Opportunities for Sustainability: Base Closures

In recent years, DND/CF has closed a number of its bases in response to reductions in funding imposed by the Government of Canada. In choosing which bases to retain, DND/CF focussed on operational requirements. Dealing with the effects of closures has required greater focus on ways to ameliorate local social and economic impacts. For example, Summerside, Prince Edward Island, has been converted to nonmilitary use under Revenue Canada.

DND/CF must build the capacity of its personnel to make better decisions if we are to bring about continuous improvement. Building that capacity will be done by applying the principles of environmental stewardship, improving skills and knowledge, and entering into partnerships with others.

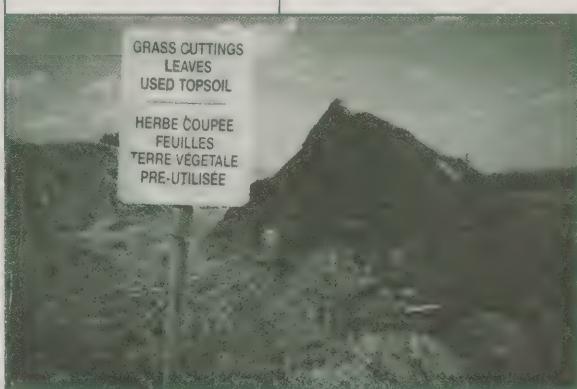
Conserving our Environment

Ecosystems

DND/CF administers more land than any organization in Canada. Routine navy, army, and air operations often require the use of large land areas, along with areas at sea and in the air. These military operations may affect those environments and the people in surrounding communities.

DND/CF recognizes its responsibility to consider environmental impacts in planning and to minimize negative impacts, particularly on sensitive or rare ecosystems and the species that depend on them. As a result, DND/CF appreciates the importance of:

Composting leaf and yard waste at CFB Borden



- ◆ protecting rare and endangered species, wetlands, and critical habitats during military activities and during nonmilitary activities on DND/CF lands;
- ◆ controlling pests without damaging nontarget species; and
- ◆ limiting the effects of noise.

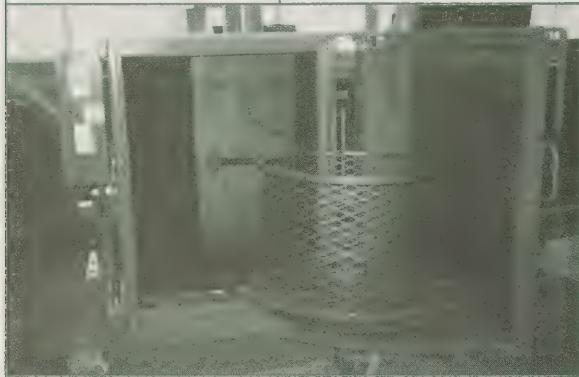
Pollution Prevention

There are opportunities in DND/CF operations to reduce the consumption of materials, increase the efficiency of resource use, and limit the effects of waste. Initially, DND/CF appears to have opportunities to deal with lowering water use, managing solid waste, and controlling the impact of sewer discharges on receiving waters.

M-113 armoured personnel carriers at CFB Wainwright



Aqueous parts cleaning system replacing a solvent bath



Hazardous Materials

The nature of DND/CF operations requires the use of many hazardous materials which, if handled improperly, can have adverse environmental impacts. A legacy remains from the era when the impact of using these materials was not understood. DND/CF recognizes that it must be aware of the current implications of its management of:

- ◆ high-risk hazardous materials;
- ◆ polychlorinated biphenyls;
- ◆ hazardous wastes;
- ◆ fuel storage tanks;
- ◆ contaminated sites; and
- ◆ spills.

Bioremediating soil at CFB Valcartier



Climate Change

DND/CF operations produce atmospheric pollutants. The large number of vehicles, the wide scope of operations, and the various technologies in use in National Defence mean that DND/CF is potentially a significant source of pollution. We must be aware of the impacts of:

- ◆ ozone-depleting substances; and
- ◆ gaseous emissions associated with global warming, smog, and acid rain.

Cultural Resources

DND/CF is responsible for carrying out its operations in a manner that respects Canada's culture and heritage. Many sites, artifacts, monuments, and buildings of cultural or historic value are located in places where our forces are active.

These resources require protection if they are to survive for current and future generations to appreciate.

Opportunities for Sustainability: Suffield National Wildlife Area

Canadian Forces Base (CFB) Suffield/Defence Research Establishment Suffield has long been a major training area for land forces, including those of Canada's NATO allies. The training area contains large tracts of prairie, much in nearly pristine condition. Due to its environmental sensitivity the area is not used for active combat training. In recognition of the importance of the prairie and its wildlife, including pronghorn antelope and mule deer, a portion of the land has been protected from disturbance. A National Wildlife Area is being created there.

The Snowbirds air demonstration squadron



DND/CF has the capability to assist a wide variety of other organizations in the drive to make development sustainable. At home and abroad, we can share our experience, knowledge, special skills, and equipment. Where appropriate, DND/CF intends to assist other government agencies, civil authorities, communities, and Canada's allies.

The Saguenay flood seen from a CF rescue support aircraft



Stewardship

The management of DND/CF's activities will directly reflect our capacity to carry out environmentally sustainable defence activities. Due regard for protection of the environment and respect for our fellow citizens will ensure the most complete fulfilment of our mandate. This approach to management, called environmental stewardship, was formally introduced within DND/CF in the late 1980s. Environmental stewardship will continue, with increased emphasis, as part of this SDS.

For DND/CF to be successful in environmental stewardship, its staff must have the skills and knowledge to prevent pollution and to conserve our natural environment. They must know their responsibilities and how they are expected to conduct the business of National Defence. To ensure that staff are appropriately knowledgeable and motivated, DND/CF will provide various formal training, communications, and recognition programs.

Medicine wheel at CFB Suffield



Consultations

Individual Responsibilities

"I am personally responsible and liable for the protection of the environment as I carry out my duties. As a member of the Regular or Reserve Force, or as a civilian employee, I am required to act with due diligence — or reasonable care — in my daily activities as directed by the environmental laws of my country."

This applies to all levels of personnel in DND, from the new recruit to the Chief of the Defence Staff, the Deputy Minister and indeed, to the Minister.

DND/CF personnel have a legal — as well as moral obligation to protect the environment. Collectively, our decisions and actions make a huge difference and do have an impact on the environment.

**Extracts from
DND's Internet site:
<http://www.dnd.ca/>**

Consultations for this SDS took two major channels: external and internal. The external consultations were aimed primarily at determining what issues face the department, and what goals and objectives should be priorities. The internal consultations determined what targets should be set under those goals and objectives, and what actions might be necessary to achieve the targets.

External Consultations

An all-day meeting was held on April 2, 1997, in Ottawa. Participants represented various organizations capable and interested in providing constructive input to National Defence on sustainable development issues. Over half of the organizations were attracted through the Canadian Environmental Industries Association and the Canadian

Environmental Network. The participants discussed links between DND/CF and sustainable development and identified the main issues they believed should be covered in the SDS.

Two public sessions were held in conjunction with other federal departments in Whitehorse and Yellowknife in June, 1997. The focus for these sessions was the impact of sustainable development issues as they are perceived in Northern Canada.

A number of one-on-one meetings were held in Ottawa with special interest groups, including the Sierra Club of Canada, Pollution Probe, and Energy Probe.

These external sessions helped define the issues outlined in the Issue Scan, as well as the goals and objectives which are presented in the next section.

Finally, an early draft plan for DND/CF's environmental agenda in the period 1997-2002 was posted on the Internet. Hard copies of the document were provided to environmental officers at each major DND/CF base for distribution to local communities. Bases were encouraged to circulate the document widely, and to engage interested neighbours in discussions of sustainable development issues.

Internal Consultations

Individuals and groups throughout DND/CF will be responsible for the necessary targets and actions to realize the goals and objectives in this strategy. Thus, internal consultations were essential to ensuring understanding of the issues, commitment to the goals and objectives, and achievement of related targets.

The Department organized a process to develop internal input to shape the SDS, which included identifying the responsible offices throughout DND/CF. This involved working with groups on the following:

- ◆ infrastructure;
- ◆ procurement;
- ◆ hazardous material;
- ◆ maintenance practices for each of the Maritime, Land, and Air maintenance systems;
- ◆ transportation and energy;
- ◆ operations in the North; and
- ◆ base/wing-level activities.

Consultations extended from headquarters to the base level and included all Capability Components and Emergency Preparedness Canada.

As with external consultations, discussions focussed on a draft environmental agenda for 1997-2002. Participants were asked to confirm the goals and objectives, suggest what related targets were achievable, and propose how an action plan would be established and progress measured.

This process proved to be extremely helpful in clarifying issues, establishing responsibilities, and setting timetables for concrete action.



Goals, Objectives, and Targets

Following directions in A Guide to Green Government, DND/CF has made certain commitments that will help National Defence contribute to sustainable development (see Table 1). The commitments are framed as goals, objectives, and targets. The goals are general, covering the major issues. The objectives divide each goal into elements DND/CF will address. The targets are as specific, measurable, and timely as possible. All the goals, objectives, and targets are end-states that DND/CF wishes to achieve.

Leopard tanks on manoeuvres



Supply ship at sea during an exercise



DND/CF's commitments deal with all of the major issues mentioned in A Guide to Green Government that are within the mandate and control of the department. As a department that is devoted to operations, and without a substantial public policy function, DND/CF concentrated on the greening of operations, dealing with procurement, waste management, water use, energy use, vehicle fleet management, and land use management. Particular attention was paid to the management of natural resources, the use of toxic substances, and controlling air emissions.

In making these commitments, within its fiscal framework, DND/CF will prioritize its efforts as follows:

- ◆ compliance with the law;
- ◆ conformity with government policy; and
- ◆ reduction of risks to the environment.

As the overriding consideration, elimination of immediate risks to human health and safety will be given precedence.

Oberon Class submarine on patrol



Action Plan

DND/CF's action plan to achieve its goals, objectives, and targets consists of:

- ◆ building capacity within DND/CF for better environmental performance;
- ◆ common steps to achieve each target; and
- ◆ target-specific actions related to particular compounds, processes, or impacts.

To fulfil its commitments, DND/CF will implement an ISO-14000-compatible environmental management system (EMS) to plan, implement, and regularly assess environmental performance.

Building Capacity

DND/CF believes that certain principles are critical to achieving the substantive goals, objectives, and targets set out in Table I. The principles that National Defence will apply to achieve sustainable defence activities are listed below.

Principle I We will act as stewards of our environment by:

- ◆ following the DND/CF Code of Environmental Stewardship;
- ◆ communicating our environmental ethic, both internally and externally;
- ◆ making senior management commitment visible;
- ◆ keeping current all environmental policies and ensuring standard operating procedures (SOPs) take the environment into account;
- ◆ integrating pollution prevention into all aspects of day-to-day activities;
- ◆ encouraging 3R (reduce/reuse/recycle) initiatives;

- ◆ using environmental impact assessment prior to implementation to predict potential impacts of DND/CF operations, projects, and activities, including new or changed activities, to ensure that those significant negative impacts are mitigated in the design and operation stages;
- ◆ using green procurement methods to purchase more environmentally sound goods and services;
- ◆ optimizing natural resource management on DND/CF lands to benefit DND/CF operations and communities over the long-term;
- ◆ identifying and managing the legacy of past defence activities;
- ◆ demonstrating responsiveness to and respect for the environment on an individual basis as we carry out our day-to-day activities; and
- ◆ using green practices and processes, and the least hazardous products, in the maintenance of equipment.

Griffon helicopter lifting off during an exercise



Principle 2 Personnel will be given the opportunity to acquire the skills and knowledge needed to prevent pollution and conserve our natural environment by:

- ◆ communicating internally a common set of values and a commitment to environmental policy;
- ◆ making available appropriate training, tools, and equipment, including
 - information on environmental policies and guidelines delivered through department-wide information sessions for middle and senior managers on environmental management practices,
 - amendments, done under the Training and Education for Environmental Stewardship (TrEES) Project, to existing military and civilian occupational, specialty, common, and general purpose training programs that integrate environmental concerns,
 - a website for information exchange;
- ◆ providing up-to-date site-specific environmental information;
- ◆ making each person's responsibilities and accountabilities known and understood;

- ◆ communicating lessons learned, successes, and opportunities to and amongst staff; and
- ◆ integrating sustainability considerations into programs to recognize achievement and encourage employee support and initiatives.

Aurora aircraft on coastal surveillance



Principle 3 Partnerships will be pursued within Canada and with other militaries around the world by:

- ◆ assisting lead agencies for environmental emergencies and environmental surveillance, including providing information collected during patrol, exercise, and training activities;
- ◆ providing aid to civil authorities in emergencies;
- ◆ establishing partnerships for natural resource management where appropriate;
- ◆ encouraging a consultative approach to community relations and public involvement in major defence environmental activities;
- ◆ encouraging a consultative approach to negotiations on laws, regulations, and agreements affecting defence activities;
- ◆ initiating and promoting Canadian defence environmental management programs to selected countries;

Halifax Class frigate on patrol



- ◆ conducting joint research on the effects of defence activities;
- ◆ assisting in the demonstration of new environmental techniques unique to military applications; and
- ◆ exchanging environmental management information and technologies.

Soldiers assisting civilians in Rwanda



- changing operating procedures and practices, including
 - rewriting specifications and standards (including maintenance procedures) that involve hazardous materials or environmentally damaging activities giving preference to products/processes that are less harmful and/or that meet environmental specifications (e.g., Eco-Logo-certified products),
 - modifying acquisition procedures and practices to provide for the minimum essential quantity of the least harmful products or systems,
 - ensuring that environmental impacts, costs, and benefits are incorporated into life-cycle analyses for all projects;
- procuring needed equipment and products,
- training personnel; and
- ◆ measure, analyse, and report on performance.

Target-Specific Actions

While achievement of each target will require the common steps outlined above, actions specific to each target will also be required. The following tables set out, by issue, the target-specific actions that are currently foreseen.

Common Steps to Achieve Each Target

To achieve each DND/CF target, it will be necessary to implement some or all of the following steps:

- ◆ identify resource requirements;
- ◆ assign responsibilities and resources;
- ◆ establish a baseline;
- ◆ research alternative products, processes, and practices;
- ◆ conduct pilot test(s);
- ◆ develop a business case;
- ◆ choose preferred alternative(s);
- ◆ obtain approval through business plan process;
- ◆ implement preferred alternative(s) by

Soldier on watch



Table 1: National Defence and the Environment.

Theme		CONSERVING OUR ENVIRONMENT	
Issue		Ecosystems	Pollution Prevention
Goals	A. The health of our ecosystems is protected	B. Pollution prevention opportunities are maximized	
Objectives	<p>A.1. Military activities are planned such that adverse impacts on ecosystems are mitigated and biodiversity is maintained</p> <p>A.2. Nonmilitary activities on DND/CF lands are conducted with minimal impacts on ecosystems and maintenance of biodiversity</p> <p>A.3. Noise impacts are mitigated</p>	<p>B.1. Consumption of resources is minimized</p> <p>B.2. Efficiency of resource use is maximized</p> <p>B.3. Effluents from defence activities and facilities meet applicable standards</p>	
Targets	<p>A.1.1. Training area management plans that protect rare and endangered species, wetlands, and critical habitat are initiated at selected training areas^[1] by 2000</p> <p>A.2.1. Natural resource management plans (e.g., forestry, hunting, cattle grazing, oil and gas extraction, recreation, and nonmilitary training) that protect rare and endangered species, wetlands, and critical habitat are initiated at selected training areas by 2001</p> <p>A.2.2. Pesticide use is reduced by 50% from 1993 levels by 2003</p> <p>A.3.1. A planning tool for noise at airfields, helicopter landing areas, small-arms ranges, and artillery ranges is produced by 1999</p>	<p>B.1.1. Treated water consumption in infrastructure is reduced by 20% from 1989-90 levels by 2001</p> <p>B.2.1. Solid waste sent to landfill is reduced by 10% from 1997 levels by 2000</p> <p>B.2.2. Construction and demolition projects where the floor area exceeds 2000 m² include waste reduction plans</p> <p>B.3.1. Liquid and solid waste streams from ships are managed to be compatible with applicable standards by 2001</p> <p>B.3.2. Sewage treatment plant and storm sewer discharges are compatible with applicable standards by 2000</p>	

[1] Borden, Chilcotin, Cold Lake, Dundurn, Farnham, Gagetown, Meaford, Nanoose, Petawawa, Shilo, Suffield, Valcartier, Wainwright.

Hazardous Materials	Climate Change	Cultural Resources
C. Human health and the environment are protected	D. The atmosphere is protected	E. Cultural resources are protected
C.1. Hazardous materials are managed responsibly	D.1. Ozone-depleting substance (ODS) releases are reduced	E.1. Cultural and heritage sites, artifacts, and monuments are protected and respected
C.2. Contaminated sites are managed responsibly	D.2. Greenhouse gas emissions are minimized	E.2. The heritage character of designated buildings is protected
C.3. Spills of hazardous materials are minimized		
C.1.1. The number of specified high-risk hazardous materials used is reduced by 5% per year	D.1.1. Products and equipment containing ODSs are phased out based on economic, environmental, and operational considerations	E.1.1. Cultural and heritage sites, artifacts, and monuments are incorporated in selected training area management plans by 1999
C.1.2. Polychlorinated biphenyls (PCBs) are sent for destruction as they are phased out	D.1.2. A downward trend in the ozone-depleting potential of reportable releases of ODSs is demonstrated	E.2.1. Heritage buildings are preserved
C.1.3. A downward trend in the quantities of hazardous waste sent for disposal is demonstrated	D.1.3. Halon use is limited to essential military requirements (ships, planes, and armoured fighting vehicles)	
C.1.4. Fuel storage tanks are brought into compliance with federal guidelines and schedules	D.2.1. Vehicles are maintained to meet manufacturers' specifications for fuel consumption	
C.2.1. Contaminated sites are identified and remediated or risk-managed by 2001	D.2.2. Energy consumption in infrastructure is reduced by 15% from 1989-90 levels by 2001	
C.3.1. A downward trend in the number and volume of reportable spills is demonstrated		

Table 2: Ecosystems Action Plan.

Target	Actions
A.1.1 Training area management plans that protect rare and endangered species, wetlands, and critical habitat are initiated at selected training areas by 2000	<p>Follow DND's Manoeuvre Area Planning Systems (MAPS) Protocol (1995), including</p> <ul style="list-style-type: none"> ◆ Conduct a natural resources inventory ◆ Assess military and nonmilitary activities ◆ Develop mitigation measures ◆ Develop restoration plans ◆ Develop follow-up plans
A.2.1. Natural resource management plans (e.g., forestry, hunting, cattle grazing, oil and gas extraction, recreation, and nonmilitary training) that protect rare and endangered species, wetlands, and critical habitat are initiated at selected training areas by 2001	<p>Update plans to reflect guidelines for sustainable resource use Integrate natural resource management plans into MAPS plans</p>
A.2.2. Pesticide use is reduced by 50% from 1993 levels by 2003	<p>Implement integrated pest management plans, including</p> <ul style="list-style-type: none"> ◆ Increase naturalized areas ◆ Decrease materials used to maintain artificial conditions ◆ Use less intensive grooming for roads/lawns ◆ Conform to long-term vegetation management plans
A.3.1. A planning tool for noise at airfields, helicopter landing areas, small-arms ranges, and artillery ranges is produced by 1999	<p>Update current noise models for fixed wing aircraft Develop noise models for helicopter landing areas, small-arms ranges, and artillery ranges Provide local communities with up-to-date noise exposure forecasts in low-level flying, marine/land/air weapons firing, and tank driving ranges</p>

Table 3: Pollution Prevention Action Plan.

Target	Actions
B.1.1. Treated water consumption in infrastructure is reduced by 20% from 1989-90 levels by 2001	<p>Design new facilities/retrofits for low water use (e.g., low use fixtures)</p> <p>Monitor treated water use on an ongoing basis</p> <p>Install water meters where appropriate</p> <p>Reuse water where practical</p> <p>Maintain water distribution systems and fixtures to minimize water loss</p>
B.2.1. Solid waste sent to landfill is reduced by 10% from 1997 levels by 2000	<p>Identify best practices to be used in waste reduction</p> <p>Develop waste reduction plans based on 3Rs (reduce/reuse/recycle), including</p> <ul style="list-style-type: none"> ◆ Green Office, PaperSave, and Blue Box programs at all office locations ◆ Separate wastes and recycle as feasible ◆ Expand partnerships with other departments or private industry to segregate and process recyclables such as vehicle batteries and compost ◆ Include packaging reuse or recycling requirements requisitions and contracts wherever it is feasible to do so without compromising the product's integrity ◆ Include waste measurement requirements in disposal contract
B.2.2. Construction and demolition projects where the floor area exceeds 2000 m ² include waste reduction plans	<p>Identify best practices to be used in design and specification of physical projects</p> <p>Expand partnerships with other departments or private industry to segregate and process recyclable building materials</p> <p>Conduct waste audits for proposed projects</p> <p>Develop and implement waste reduction action plans based on waste audits</p>
B.3.1. Liquid and solid waste streams from ships are managed in accordance with applicable standards by 2001	<p>Implement Maritime Environment Protection Projects</p> <p>Incorporate up-to-date waste management standards in ship standard operating procedures (SOPs)</p>
B.3.2. Sewage treatment plant and storm sewer discharges are compatible with applicable standards by 2000	<p>Complete the Sewage Treatment Plant Optimization Program</p> <p>Monitor sewage plant effluent quality on a regular basis</p> <p>Conduct a risk assessment of storm sewer effluents</p> <p>Monitor and manage high-risk storm sewer effluents</p>

Table 4: Hazardous Materials Action Plan.

Target	Actions
C.I.1. The number of specified high-risk hazardous materials used is reduced by 5% per year	Develop a screening process to identify high-risk industrial products Eliminate specified materials through pollution prevention techniques
C.I.2. Polychlorinated biphenyls (PCBs) are sent for destruction as they are phased out	Follow DND's PCB Phase-out Strategy Ensure appropriate storage of waste materials Send PCBs for destruction when economical
C.I.3. A downward trend in the quantities of hazardous waste sent for disposal is demonstrated	Implement recycle/reuse programs for hazardous wastes (e.g., solvents, paint strippers, batteries, antifreeze, coolants, transmission oils, lubricants, used motor oil) Avoid generation of hazardous wastes through pollution prevention techniques (including green procurement)
C.I.4. Fuel storage tanks are brought into compliance with federal guidelines and schedules	Implement DND's Tank Management Aide Memoire (1996), including <ul style="list-style-type: none"> ◆ Identify tanks and their condition ◆ Retrofit, replace, or decommission tanks to reduce the risk of leaks
C.2.1. Contaminated sites are identified and remediated or risk-managed by 2001	Implement the DND Contaminated Site Remediation Framework (1995), including <ul style="list-style-type: none"> ◆ Identify sites and assess risks at each ◆ Remediate or risk manage problem sites
C.3.1. A downward trend in the number and volume of reportable spills is demonstrated	Develop a reportable spill standard by 1998 Report spills in a consistent and timely manner Assess processes and materials that are involved in spills Institute elimination, substitution, and re-engineering measures Establish storage/use/emergency procedures where appropriate Construct safe storage and handling facilities for hazardous materials, with appropriate secondary containment in case of accidental release

Table 5: Climate Change Action Plan.

Target	Actions
D.I.1. Products and equipment containing ODSs are phased out based on economic, environmental, and operational considerations	<p>Develop phase-out and substitution plans for air conditioning and refrigeration equipment that use CFCs, with priority for substances with high ozone-depleting potential</p> <p>Develop phase-out and substitution plans for cleaning and coating systems that use ODSs, including those for aircraft oxygen systems, parts cleaning, and vapour degreasing</p> <p>Design, install, and operate appropriate ODS emission control equipment, including high-efficiency purge units (maintenance facilities, garages)</p>
D.I.2. A downward trend in ozone-depleting potential of reportable releases of ODSs is demonstrated	<p>Improve equipment to prevent releases</p> <p>Develop a reportable release standard by 1998</p> <p>Report releases in a consistent and timely manner</p>
D.I.3. Halon use is limited to essential military requirements (ships, planes, and armoured fighting vehicles)	<p>Decommission halon systems from all buildings and bank them for essential military applications</p> <p>Assess which systems are essential</p> <p>Research and develop fire protection alternatives for military applications</p>
D.2.1. Vehicles are maintained to meet manufacturers' specifications for fuel consumption	<p>Put in place a fleet management system, partnered with industry, that is based on best practices, permits benchmarking, and measures the performance of the fleet</p>
D.2.2. Energy consumption in infrastructure is reduced by 15% from 1989-90 levels by 2001	<p>Adopt the National Energy Code for new and retrofit projects (e.g., using heat recovery ventilation, air locks)</p> <p>Use best practices in building design (e.g., orient/construct buildings to optimise passive solar gain in winter)</p> <p>Rationalise infrastructure (reduce overall space and heated space)</p>

Table 6: Cultural Resources Action Plan.

Target	Actions
E.I.I. Cultural and heritage sites, artifacts, and monuments are incorporated in selected training area management plans by 1999	<p>Update plans to reflect guidelines for preservation</p> <p>Make sites, monuments, and artifacts available for appreciation subject to preservation and operational requirements</p>
E.2.I. Heritage buildings are preserved	<p>Maintain heritage buildings in accordance with federal policy</p> <p>Make buildings available for appreciation subject to preservation and operational requirements</p>

Measurement, Analysis, and Reporting of Performance

National Defence has identified various performance measures that can be reported at the departmental level. The criteria for choice of these indicators included whether they were:

- ◆ meaningful (i.e., relevant to objectives) and comparable from one period to the next and one location to another;
- ◆ credible (i.e., reliable, believable, and scientifically sound);
- ◆ simple (i.e., easy to understand); and
- ◆ feasible to collect and analyse (i.e., reasonable and affordable).

Given that the department is in the early stages of monitoring its environmental effects, and that there are limited resources for monitoring, the choice was made to limit the number of activities for which results would be measured. It will not be possible to measure everything everywhere. Therefore, using the International Institute for Sustainable Development's pressure-state-response model for performance measurement, the focus was put on the pressures that result from DND/CF activities.

Monitoring of the general state of the environment appears to fall within the mandate of Environment Canada and other government departments at a

national scale, and while DND/CF may be able to contribute through partnerships (as outlined in the section on Building Capacity), it is not appropriate for the department to undertake specific monitoring programs in that area. However, DND/CF will begin researching how to monitor for ecologically sustainable military operations on an experimental basis (at CFB Shilo). In addition, to support continuous improvement, DND/CF will be developing an environmental review program as part of its EMS.

Monitoring of management responses, particularly training and attitudes, may be required at some point in future if performance measurement on DND/CF's substantive issues reveals that progress is inadequate. The assumption will be made that value added through better management techniques will be revealed by a lessening of the pressures we place on the environment. Until the need arises to challenge that assumption, anecdotal reports on the progress of our management responses will suffice.

Performance measures will be calculated using data produced at the command/operation level — that is, within each base, wing, or operating unit. The following tables list proposed performance measures for each of the issues DND/CF is addressing in this SDS.

Table 7: Ecosystems Performance Measures.

Target	Performance Measures
A.I.1. Training area management plans that protect rare and endangered species, wetlands, and critical habitat are initiated at selected training areas by 2000	% of selected training areas at which the MAPS Protocol have been initiated
A.2.1. Natural resource management plans (e.g., forestry, hunting, cattle grazing, oil and gas extraction, recreation, and nonmilitary training) that protect rare and endangered species, wetlands, and critical habitat are initiated at selected training areas by 2001	% of selected training areas at which natural resource management plans have been initiated
A.2.2. Pesticide use is reduced by 50% from 1993 levels by 2003	Amount (weight) of pesticides used annually
A.3.1. A planning tool for noise at airfields, helicopter landing areas, small-arms ranges, and artillery ranges is produced by 1999	Completed planning tool in place

Table 8: Pollution Prevention Performance Measures.

Target	Performance Measures
B.1.1. Treated water consumption in infrastructure is reduced by 20% from 1989-90 levels by 2001	Amount (volume) of water used annually
B.2.1. Solid waste sent to landfill is reduced by 10% from 1997 levels by 2000	Amount (weight) of solid waste landfilled annually
B.2.2. Construction and demolition projects where the floor area exceeds 2000 m ² include waste reduction plans	% of construction and demolition projects where the floor area exceeds 2000 m ² with waste reduction plans incorporated
B.3.1. Liquid and solid waste streams from ships are managed to be compatible with applicable standards by 2001	% of ships and auxiliary vessels compatible with applicable standards
B.3.2. Sewage treatment plant and storm sewer discharges are compatible with applicable standards by 2000	% of sewage treatment plants compatible with applicable standards % of storm sewers compatible with applicable standards

Table 9: Hazardous Materials Performance Measures.

Target	Performance Measures
C.I.1. The number of specified high-risk hazardous materials used is reduced by 5% per year	% of high-risk hazardous materials removed from use annually Number of high-risk hazardous materials removed from use annually
C.I.2. Polychlorinated biphenyls (PCBs) are sent for destruction as they are phased out	Amount (volume and weight) of PCBs removed from service annually Amount (volume and weight) of PCBs destroyed annually
C.I.3. A downward trend in the quantities of hazardous waste sent for disposal is demonstrated	Annual quantity of hazardous waste disposal Downward trend in hazardous waste sent for disposal annually
C.I.4. Fuel storage tanks are brought into compliance with federal guidelines and schedules	% of fuel storage tanks in compliance with guidelines
C.2.1. Contaminated sites are identified and remediated or risk-managed by 2001	Number of contaminated sites Number of contaminated sites remediated annually % of contaminated sites where risk management plans are complete and in use Area of residual contamination above CCME levels of concern (and % of total DND/CF lands)
C.3.1. A downward trend in the number and volume of reportable spills is demonstrated	Number of spills annually by Transportation of Dangerous Goods Regulations hazard class Amount (volume and weight) of material released annually in spills by TDGR hazard class

Table 10: Climate Change Performance Measures.

Target	Performance Measures
D.I.1. Products and equipment containing ODSs are phased out based on economic, environmental, and operational considerations	Amount (volume and/or weight) of refrigerants remaining in buildings Amount (volume and/or weight) of refrigerants taken from buildings annually weighted for ozone-depleting potential
D.I.2. A downward trend in ozone-depleting potential of reportable releases of ODSs is demonstrated	Number, weight, and ozone-depleting potential of reportable releases annually
D.I.3. Halon use is limited to essential military requirements (ships, planes, and armoured fighting vehicles)	Amount (weight) of halon remaining in infrastructure Amount (weight) of halon taken from infrastructure annually
D.2.1. Vehicles are maintained to meet manufacturers' specifications for fuel consumption	Fuel consumption per 100 km travelled Total distance travelled and fuel consumed
D.2.2. Energy consumption in infrastructure is reduced by 15% from 1989-90 levels by 2001	Amount (joules) of energy used annually

Table 11: Cultural Resources Performance Measures.

Target	Performance Measures
E.1.1. Cultural and heritage sites artifacts, and monuments are incorporated in selected training area management plans by 1999	% of selected training areas with completed management plans
E.2.1. Heritage buildings are preserved	Number and % of heritage buildings at constant or improving facility condition index

